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# Collaboration Area Highlights Webinar

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April 2020

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**Brain trust of Earth  
science data professionals**



Multiple Science  
Domains



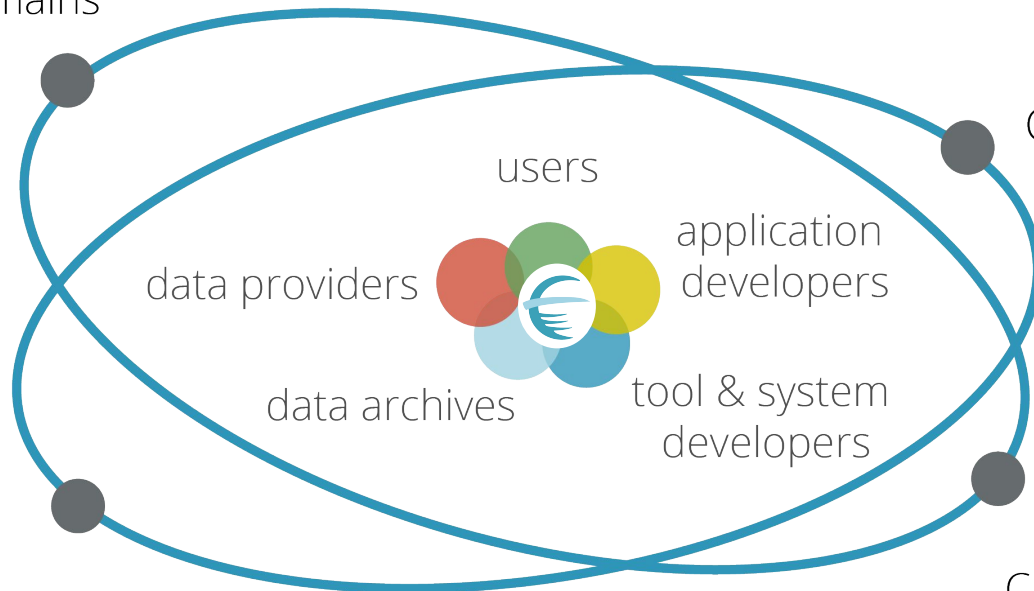
Corporate



Cross-  
Agency



Academia



# COLLABORATION AREAS

## COMMITTEES

- **Data Stewardship**
- Education
- **Information Technology and Interoperability**
- Semantic Technologies

**[ESIPFED.ORG/COLLABORATE](https://esipfed.org/collaborate)**

## CLUSTERS

- **Ag & Climate**
- Air Quality
- **CLEAN Network**
- Cloud Computing
- Community Data
- **Community Resilience**
- COPDESS
- Community Ontology Repository

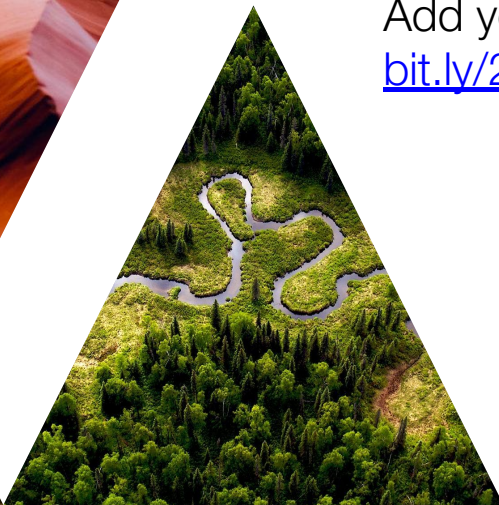
- **Disaster Lifecycle**
- **Discovery**
- Documentation
- Drones
- **EnviroSensing**
- **IM Code Registry**
- Information Quality
- Machine Learning
- Marine Data
- Research Object Citation
- **Schema.org**
- **Semantic Harmonization**
- **Sustainable Data Mgmt**







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# Presentations

Add your questions:

[bit.ly/2020\\_Collaboration\\_Highlights](https://bit.ly/2020_Collaboration_Highlights)

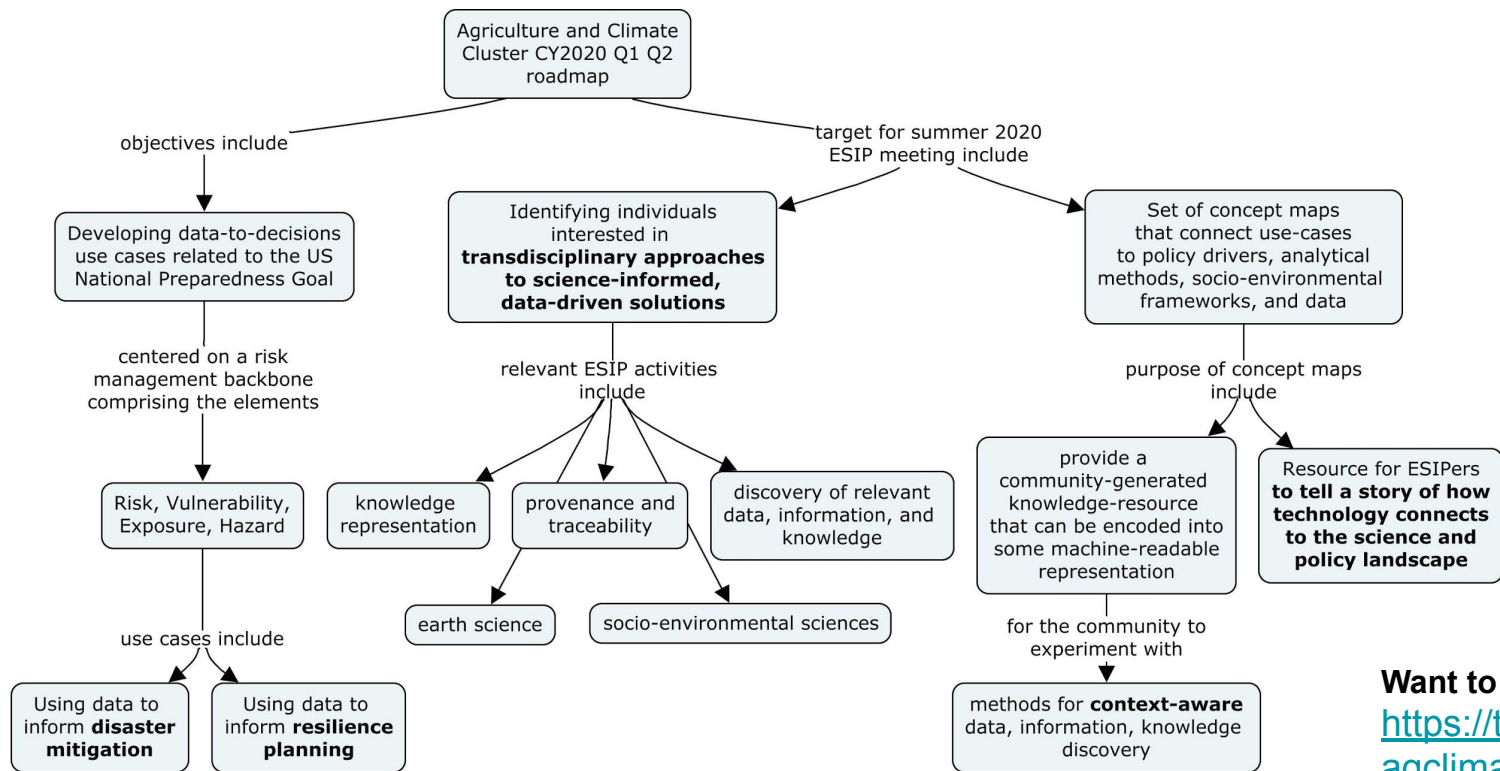
Supported by:



# Agriculture & Climate



*Applying science and technology to agro-ecosystem societal challenges*

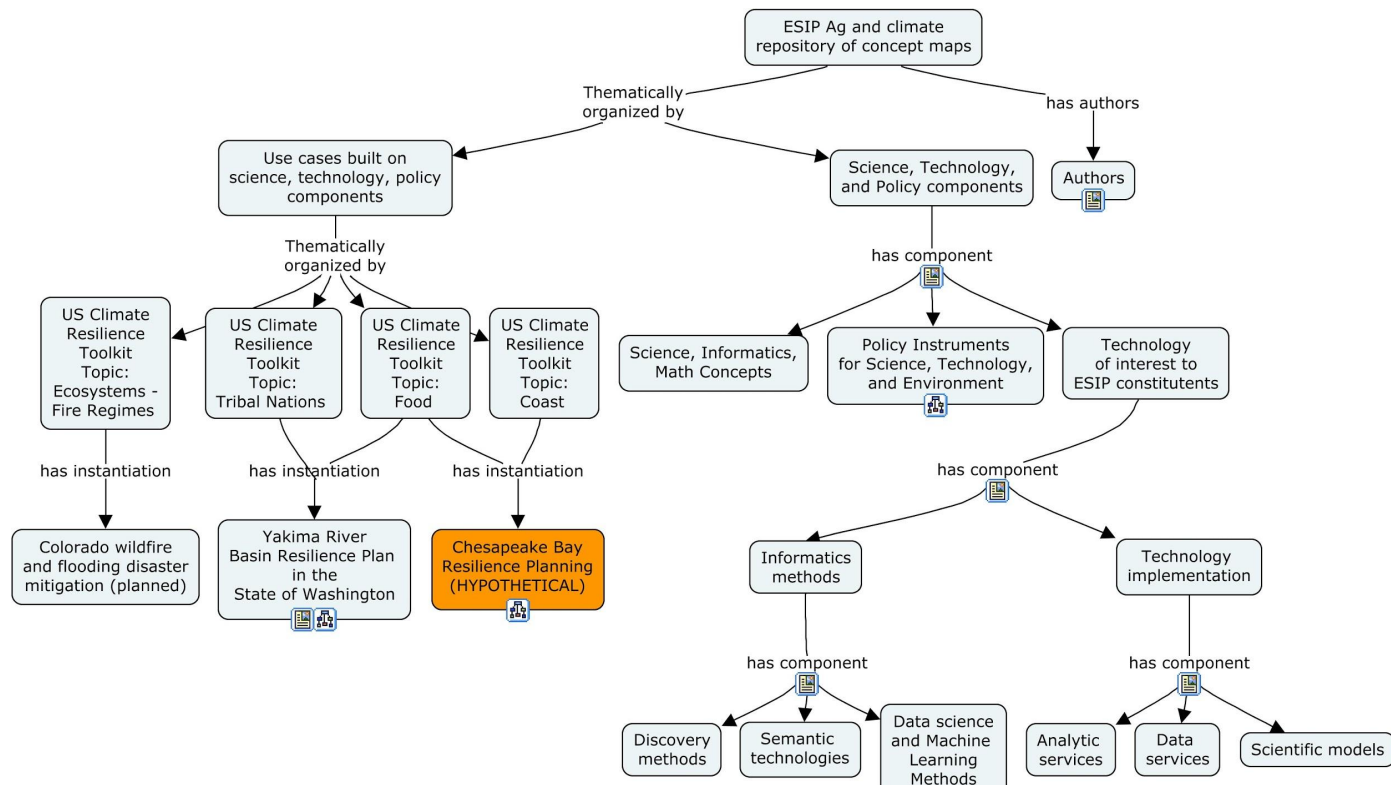


Want to learn more?  
<https://tinyurl.com/esipagclimate>



# Agriculture & Climate

*Applying science and technology to agro-ecosystem societal challenges*



**Want to learn more?**  
<https://tinyurl.com/esipagclimate>

# Agriculture & Climate

*Applying science and technology to agro-ecosystem societal challenges*



To learn more:

- Overview presentation: Next Tuesday, 2020-04-28, 1500 hrs EDT (see ESIP telecon and meeting calendar for details)
- Concept mapping activity: <https://tinyurl.com/cy2020-ag-climate>
- Ag & climate cluster: <https://tinyurl.com/esipagclimate>
- Join ESIP slack channel: #ag-climate
- Contact co-chairs:
  - Bill Teng (william.l.teng --at-likethissign-@-- nasa.gov)
  - Brian Wee (bwee --at-likethissign-@-- massiveconnections.com)

**Want to learn more?**

<https://tinyurl.com/esipagclimate>



# Community Resilience Cluster

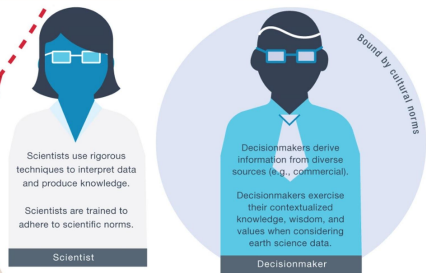
## Goal of ESIP's Community Resilience Cluster

- To enhance community resilience through culturally meaningful improvements to data accessibility and informatics tools.





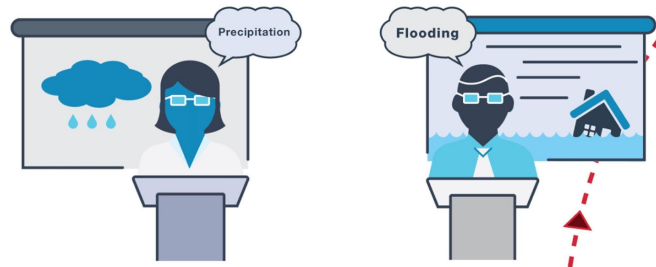
## Misalignment of Goals



## Human Dimensions of Earth Science Data



## Finding the Right Data



## Current Work:

Preparing a problem statement addressing the barriers faced in utilizing Earth Science data by community decision makers.

Read more here: <https://bit.ly/2VHEPWq>

# Community Resilience Cluster



## What's Next?

Finishing up the problem statement

Continue collaborating across groups

Looking at providing guidelines for data providers to foster community resilience

Get Involved:

**Join our Community Resilience Cluster!**

Wiki page:

[http://wiki.esipfed.org/index.php/Community\\_Resilience](http://wiki.esipfed.org/index.php/Community_Resilience)

Teleconferences: 3<sup>rd</sup> Wednesday of the month at  
4:00 pm Eastern

Join the email list:

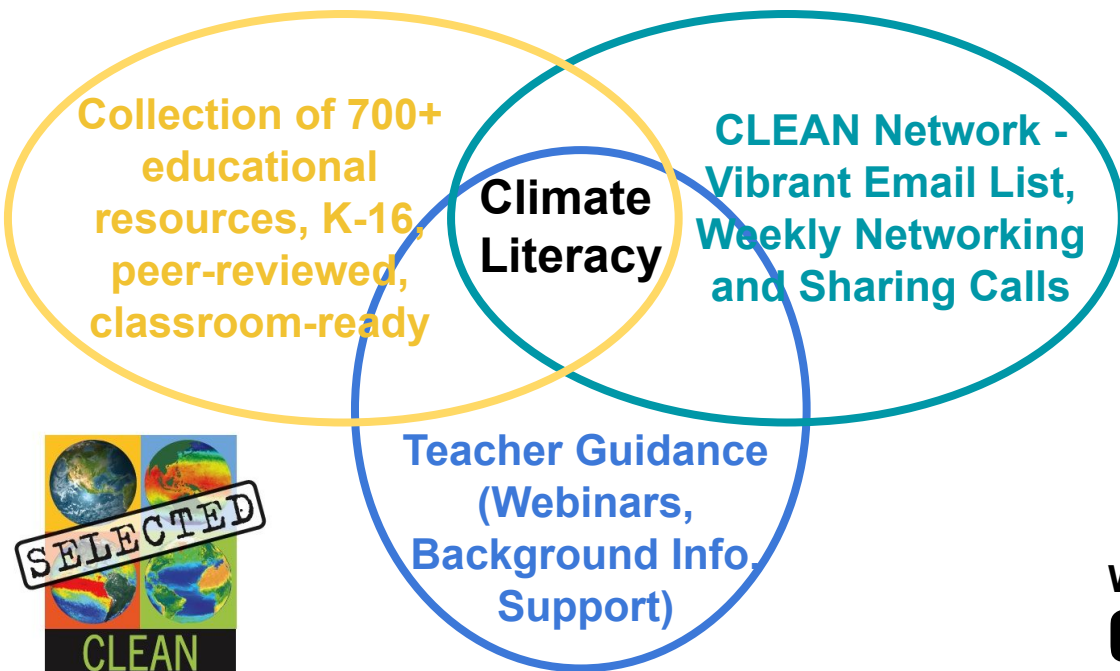
<https://lists.esipfed.org/mailman/listinfo/esip-communityresilience>

Join the Slack Channel: Join ESIP Slack  
(<https://esip-slack-invite.herokuapp.com/>),  
then find #communityresilience channel

# Climate Literacy and Energy Awareness Network (CLEANet.org)



**MISSION:** Steward a collection of climate and energy science educational resources and to support a community of professionals committed to improving climate and energy literacy



## Get involved

**Weekly Calls** (Tue 1 pm ET)  
**Email List**  
**STEM Flash Emails**  
**Webinars**  
**Ambassador Program.**  
**Review Camp Panelist**

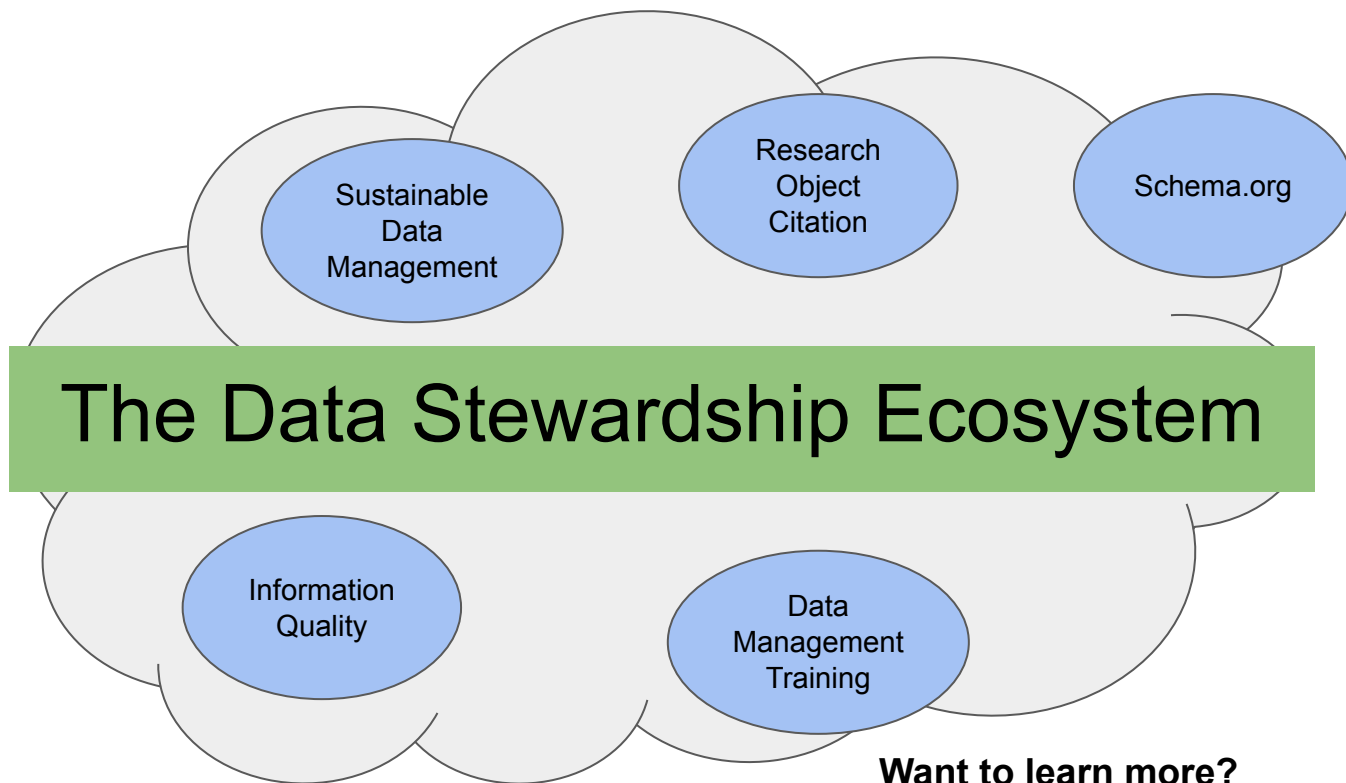
Want to learn more?

**Contact: [clean@colorado.edu](mailto:clean@colorado.edu)**



# Data Stewardship Committee

*Developing and fostering practices and standards in the field of Earth science informatics.*



Facilitating  
cross-cluster  
collaboration to support  
synthesis goals in data  
management.

Want to learn more?

**Contact: [esip-preserve@lists.esipfed.org](mailto:esip-preserve@lists.esipfed.org)**

# 2019 Highlights

- **New Chair:** Amber Budden
- **New Co-Chairs:** Kelsey Breseman & Daniella Lowenberg
- ISO 19165-2 Geographic information -- Preservation of digital data and metadata -- Part 2: Content specifications for Earth observation data and derived digital products. (Information Quality Cluster)
- Data citation review published <http://doi.org/10.5334/dsj-2019-052> (Research Object Citation)
- Data risk matrix published <http://doi.org/10.5334/dsj-2020-010> (Data Stewardship, Research Object Citation)
- White paper [“Understanding the Various Perspectives of Earth Science Observational Data Uncertainty”](#) (Information Quality)

Want to learn more?

**Contact: [esip-preserve@lists.esipfed.org](mailto:esip-preserve@lists.esipfed.org)**



# 2020 Priorities

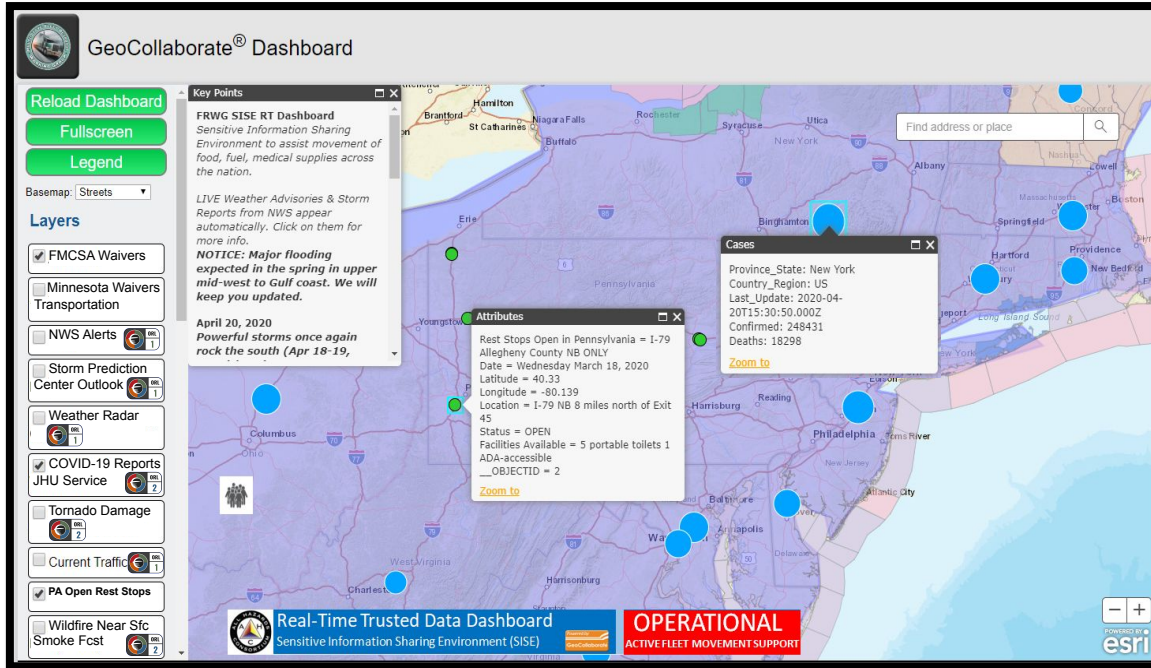
- **Repository finder** - Denise & Daniella
- **FAIR metrics** - Peng (*Information Quality Cluster*)
- **Educational Resources** - Nancy  
(*Data Management Training Clearinghouse*)
- **Citizen Science Data Management** - Alexis & Yaxing (*Information Quality*)
- **Schema.org Evaluation** - Ruth (*Schema.org*)

Want to learn more?

**Contact: [esip-preserve@lists.esipfed.org](mailto:esip-preserve@lists.esipfed.org)**

# Disaster Lifecycle Cluster

ABOUT: *Identifying & Applying **Trusted Data** to Share Across Platforms to Operational Sectors, Evolving ORLs and Engaging ESIP members to improve collaborative decision making*



## NEW AND NOTEWORTHY

Operational Readiness Levels Adopted



DHS  
FEMA



All Hazards Consortium  
American Logistics Aid Network (ALAN)

COVID-19 Response Support Ongoing  
Transportation Sector  
Food, Fuel, Medical Supplies  
Population Density & COVID-19 Tracking

Summer Meeting Breakout on COVID-19  
Planning underway  
Encourage ESIP participation

Tags:

**Disasters, Trusted Data, Decision Making, Real-Time ORL, Collaboration, Data Sharing, Cross-Platform**

Want to learn more?

Contact: Karen Moe [karen.moe@earthlink.net](mailto:karen.moe@earthlink.net)

Dave Jones [dave@stormcenter.com](mailto:dave@stormcenter.com)

[www.esipfed.org](http://www.esipfed.org)

ESIP is supported by



& 150+ partner organizations

#ESIPfed

# Disaster Lifecycle Cluster



ABOUT: *Identifying & Applying **Trusted Data** to Share Across Platforms to Operational Sectors, Evolving ORLs and Engaging ESIP members to improve collaborative decision making*

1. **Member Highlights: SEDAC** has developed the COVID-19 viewer to help users understand the age distribution and population density of Coronavirus hotspots. (Currently in Testing)
2. **Member Highlights: StormCenter/GeoCollaborate:** Populating Fleet Response Working Group SISE Dashboard with COVID-19 related data services, NOAA data and transportation data, sharing in real-time across platforms easily to help movement of critical supplies across the nation
3. Cluster is working on planning Summer meeting breakout session (now 2 sessions) on COVID-19 from identification of trusted data sources within USG to leveraging private sector data for improved decision making
4. Cluster is working to accelerate access to data holdings for operational use and testing. (For example access to EOSDIS NRT data, Element84 AWS Snowball efforts)
5. Cluster would like more participants and other cluster collaboration as we dive into specific user cases such as using **Drone** imagery, determining soil conditions after wildfires (**Ag & Climate**), **Discovering** more TRUSTED data sources for consideration in decision-making process and identifying additional **Information Technology & Interoperability** pathways.

Want to learn more?

Contact: Karen Moe [karen.moe@earthlink.net](mailto:karen.moe@earthlink.net)

Dave Jones [dave@stormcenter.com](mailto:dave@stormcenter.com)



# Disaster Lifecycle Cluster



ABOUT: *Identifying & Applying **Trusted Data** to Share Across Platforms to Operational Sectors, Evolving ORLs and Engaging ESIP members to improve collaborative decision making*



ESIP Winter Meeting January 7-9, 2020

## Driving Decisions with Trusted Data



## ESIP Winter Meeting Poster

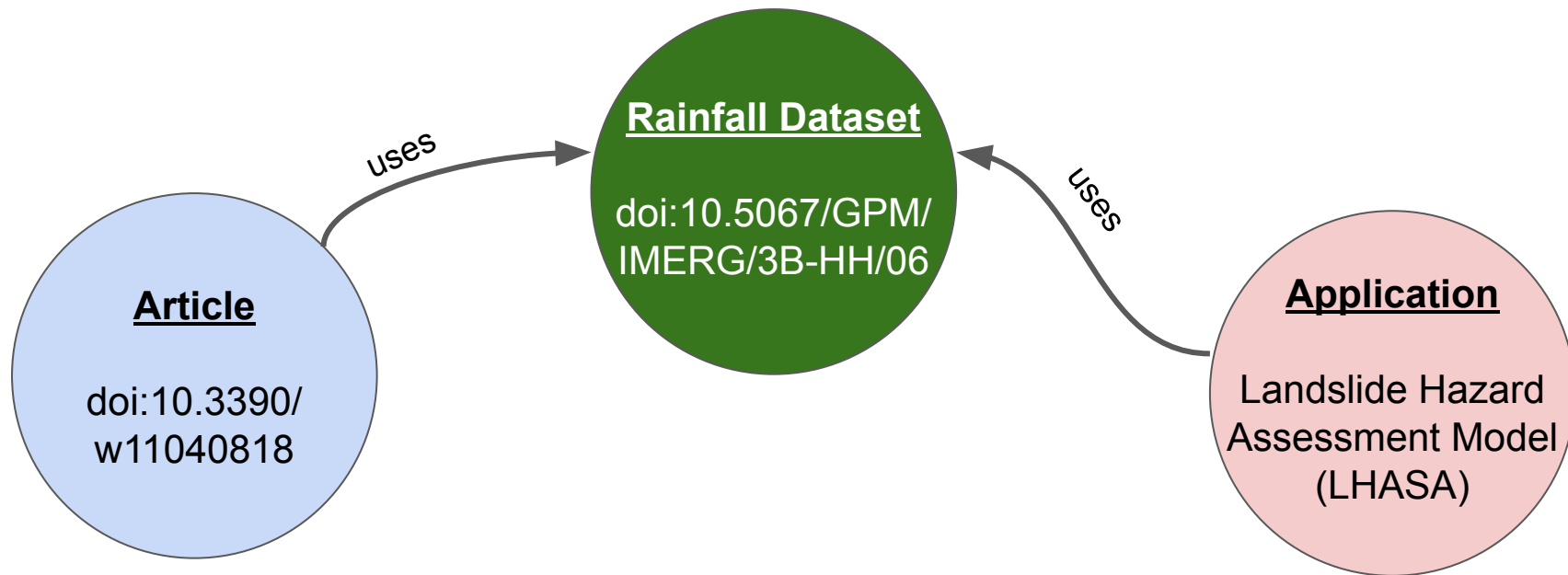


Karen Moe describing ESIP Disaster Lifecycle poster at Winter 2020 meeting



# Discovery Cluster - Usage-Based Edition

*Have use: got data?*





# Discovery Cluster - Usage-Based Edition

*Have use: got data?*



User Story Template

Collect User Stories

Collect Dataset-Use Relationships

*Hackfest!*

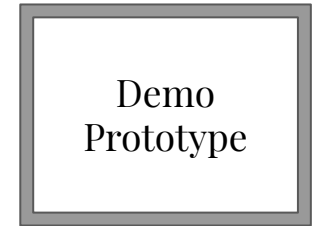
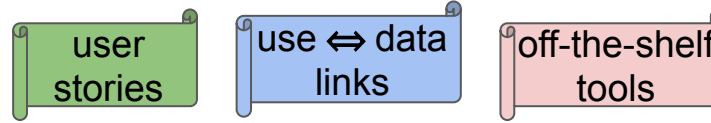
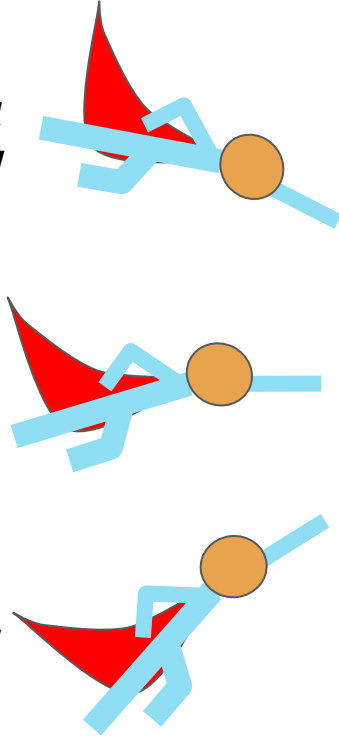
# Discovery Cluster - Usage-Based Edition

*Have use: got data?*

*(meta)data  
wranglers!*

*application  
owners!*

*developers!*



# The Information Management Code Registry

*Software Solutions for Information Management Needs*



## IM software

Providing software for IM tasks whether run from a user's local machine or accessed via web-services.



## Open source

Emphasizing freely accessible and community supported software while not excluding proprietary sources.



## Small teams

Focused on the needs of individuals and small research teams working in the “Environmental Sciences” domain.



# Goals



## **Accelerate IM tasks**

Simplify discovery and use through a substantial registry searchable by task, language, and science domain, returning high level information for fitness of use assessments.



## **Facilitate development**

Highlight new opportunities by identifying coverage gaps, openly discussing and recording community ideas, and organizing hackathons.

# Activities



## Implementation

Complete.



## Curation

Ongoing manual process.



## Discovery

Simple search augmented by controlled vocabularies.



## Maintenance

Automation will ensure accuracy and reduce effort.



## Engagement

Creating new tools as a community.

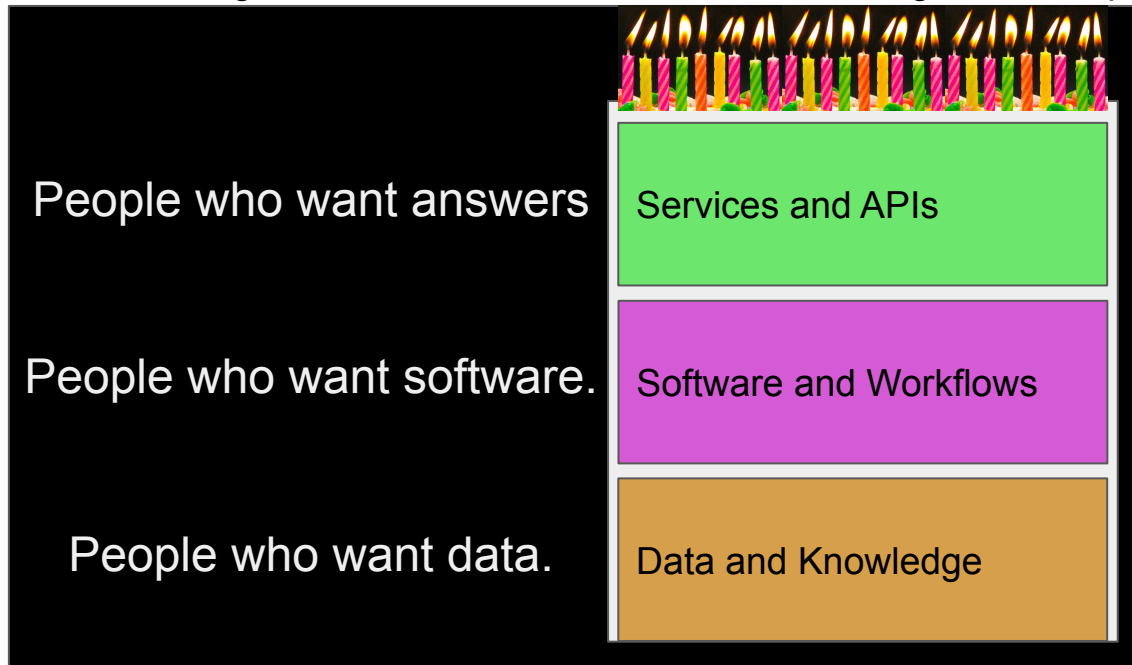
**Get Involved!**  
**[bit.ly/IMCRwiki](https://bit.ly/IMCRwiki)**





# Information Technology and Interoperability (IT&I)

Aim to ensuring that information can be shared and integrated to improve Earth science using IT&I best practices.



Tags:

**Interoperability, Technology, Reproducibility**

**Webinars Focusing on New  
or Progressing Topics**

**Recent:**

**Cloud Technologies  
Webby-standard practices  
Structured Data  
Science Gateways**

Want to learn more or contribute?

**Contact:**  
**[dblodgett@usgs.gov](mailto:dblodgett@usgs.gov)**

# Schema.org Cluster



Common publishing patterns for describing research data on your web pages using *schema.org*



Tags:

**Schema.org, Structured Data, RDF**

Want to learn more?

**science-on-schema.org**



# Schema.org Cluster

Common publishing patterns for describing research data on your web pages using *schema.org*



## 1. Develop guidelines @ [science-on-schema.org](https://science-on-schema.org)

Telecons:

- 1st Monday at 5pm ET/2pm PT
- 4th Thursday at 2:30pm ET/11:30am PT

[more info](#) (google doc)



## 2. Educate the community through workshops

ESIP Meetings, AGU, and more...

Tags:

**Schema.org, Structured Data, RDF**

Want to learn more?

**[science-on-schema.org](https://science-on-schema.org)**



# Schema.org Cluster



Common publishing patterns for describing research data on your web pages using *schema.org*

## Latest Release: v1.1 on April 1, 2020 *(no joke)*

DOI [10.5281/zenodo.2628755](https://doi.org/10.5281/zenodo.2628755)

- Persistent Identifiers
- Dataset Licenses
- Distinguish Dataset **Metadata files** from **Data files**

**7 contributors!!!** - [Matt Jones](#), [Dave Viegla](#), [Stephen Richard](#), [Ruth Duerr](#), [Lewis John McGibbney](#), [Charles Vardeman II](#), [Douglas Fils](#), [Adam Shepherd](#).

## Release: v1.2 ([in progress](#))

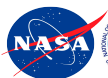
- Describing **Dataset Variables**
- **Provenance** of Dataset DOIs (versioning)
- **Validators** for science-on-schema.org patterns (using SHACL)
- Better descriptions of **temporal coverage** (using OWL-TIME)
- and more...

Tags:

**Schema.org, Structured Data, RDF**

Want to learn more?

**science-on-schema.org**

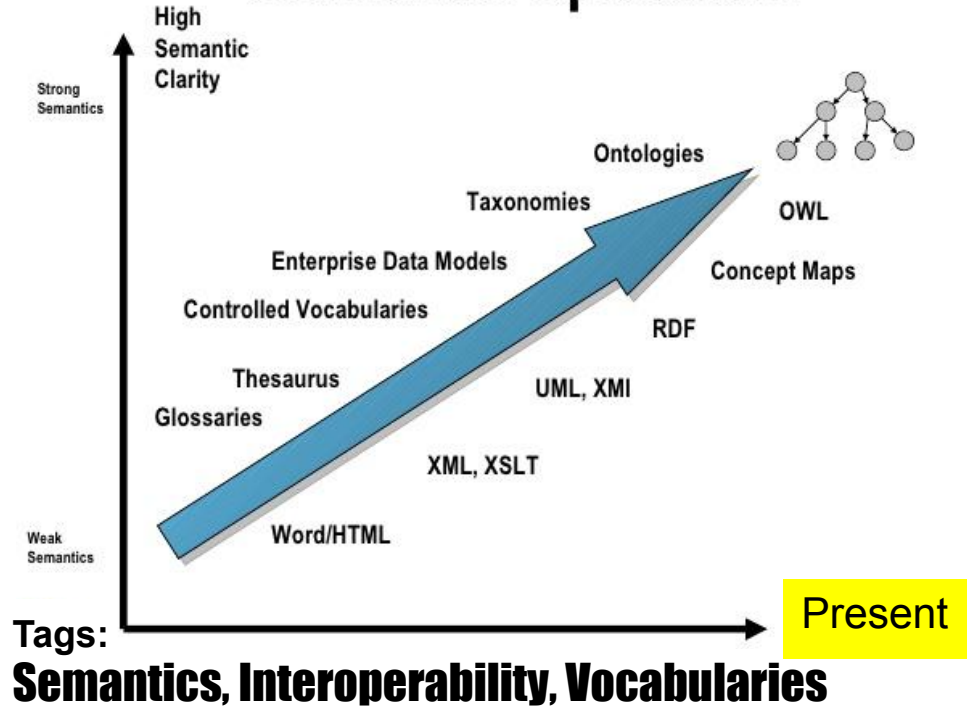


# Semantic Harmonization Cluster



ABOUT: *We make data matter. Our focus is on how to make data (which are heterogeneous in terminologies, granularity, and scale) interoperable.*

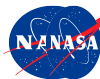
## Semantic Spectrum



- Working to develop, improve, and disseminate community agreed upon best practices for harmonizing semantic resources at all levels.

Working to align & harmonize the SWEET ontology with other commonly used, overlapping ontologies, such as ENVO.

**Want to learn more? Contact:**  
**[esip-semanticharmonization@lists.esipfed.org](mailto:esip-semanticharmonization@lists.esipfed.org)**



# Semantic Harmonization Cluster



ABOUT: *We make data matter. Our focus is on how to make data interoperable.*

- 1) We recognize the **value of standard vocabularies and ontologies** to support research communication, data sharing and interoperability (the *I* in **FAIR** also supports **findability and Re-Usability** ).
- 2) But there are **too many competing local/domain standard vocabularies** and too little formalization of what they mean.
- 3) Efforts to merge, integrate and harmonize a range of Earth and Environmental Science vocabularies and ontologies have **gained new visibility and support**.
- 4) Improved methods and standards for semantic harmonization are reaching a **mature level and include tool support**.
- 5) ESIP represents a community-of-interest with the range of resources to demonstrate a **best-practice proof of concept for semantic harmonization**.
- 6) We also see value in enhancing **SWEET** as a framework, **ontological foundation for all of Earth and Space Sciences**.

**Want to learn more? Contact: [esip-semanticharmonization@lists.esipfed.org](mailto:esip-semanticharmonization@lists.esipfed.org)**



# Semantic Harmonization Cluster



ABOUT: *We make data matter. Our focus is on how to make data interoperable.*

Ice shelf example:

- ENVO Definition from GCW work - An ice mass which is
  1. attached to the coast
  2. at least 2 meters in thickness
  3. forms where a glacier or ice mass flows down to a coastline and onto the ocean surface and
  4. grows by annual snow accumulation or by the seaward extension of land glaciers.
- Envo Axioms
  - partially\_surrounded\_by some atmosphere
  - attached to some sea coast
  - has quality some buoyancy
  - adjacent to some marine water body
  - formed as result of some snowfall
  - land ice mass
  - formed as result of some mass ice flow

In a current SWEET pull request

- <http://sweetontology.net/realmCryo/IceShelf> uses the same definition as ENVO does
- Axioms
  - closeMatch to ENVO Ice shelf
- Annotations
  - Time the definition was added
  - Who created the update
  - Provenance of the derivation from ENVO to SWEET

**Want to learn more?**

**Contact:**

[esip-semanticharmonization@lists.esipfed.org](mailto:esip-semanticharmonization@lists.esipfed.org)

**Slack:** #semantic-harmonization





# Some Useful Sources

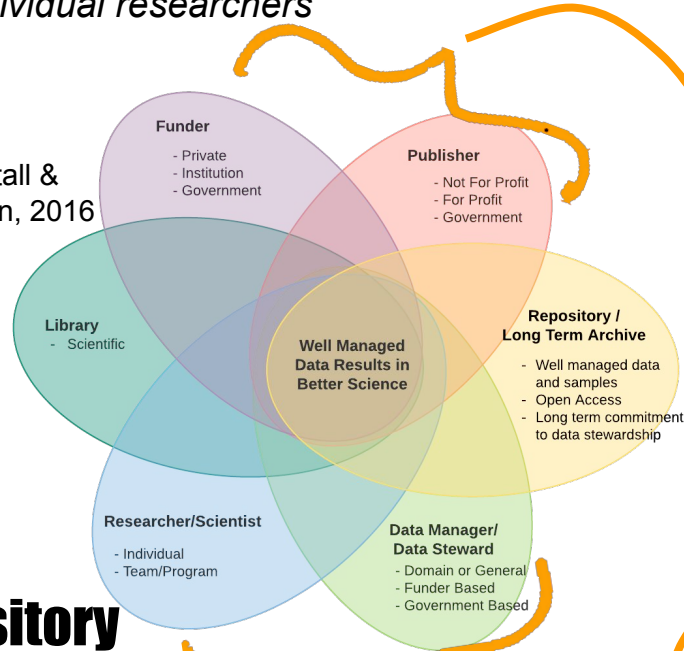
- Email List: **esip-semanticharmonization@lists.esipfed.org**
- ESIP Wiki/Portal: <http://wiki.esipfed.org/index.php/SemanticHarmonization>
- Slack Workspaces/Channels: [esip-all.slack.com](https://esip-all.slack.com)
  - #geosemantics\_symposium
  - #semanticharmonization
  - #sweetontology
- ESIP Calendar: <https://www.esipfed.org/telecons>
- Video Presentations at Winter ESIP Conference:  
<https://www.youtube.com/watch?v=tr0coi5ZQvM&feature=youtu.be>
- Sweet Github: <https://github.com/ESIPFed/sweet/issues/> or
- ENVO issue tracker: <https://github.com/EnvironmentOntology/envo/issues/>

# Sustainable Data Management



*Mechanisms for sustainable collaboration and coordination among repositories to benefit research networks and individual researchers*

From: Stall & Robinson, 2016



## NEW AND NOTEWORTHY

Funders and Publishers need mechanisms to measure their **Return on Investment**

Parr, et al 2019  
<https://doi.org/10.5334/dsj-2019-058>

Robust interoperability promoted through adherence to standards and a **Common Technical Vision**

Gries, et al. 2018  
<https://doi.org/10.5334/dsj-2018-022>

Researchers and data managers must understand the **Range of Services** offered by repositories

re3data.org  
repository registry

**RoI,  
Repository  
Interoperability,  
Data Sustainability**

[http://wiki.esipfed.org/index.php/Sustainable\\_Data\\_Management](http://wiki.esipfed.org/index.php/Sustainable_Data_Management)



# Sustainable Data Management



*Mechanisms for sustainable collaboration and coordination among repositories to benefit research networks and individual researchers*

## Possible future directions

### Disband

- re-integrate with Data Stewardship

### Guidelines for Repositories

- Make judgements
  - Funders
  - users/contributors
- Plan improvements, alignment
- Initially: position statement

**RoI,  
Repository  
Interoperability,  
Data Sustainability**

## Questions

Is there another collaboration area we should merge with to work on repository topics?

Would a “Guidelines for Repositories” be useful to you?

**[http://wiki.esipfed.org/index.php/Sustainable\\_Data\\_Management](http://wiki.esipfed.org/index.php/Sustainable_Data_Management)**



# ESIP EnviroSensing Cluster

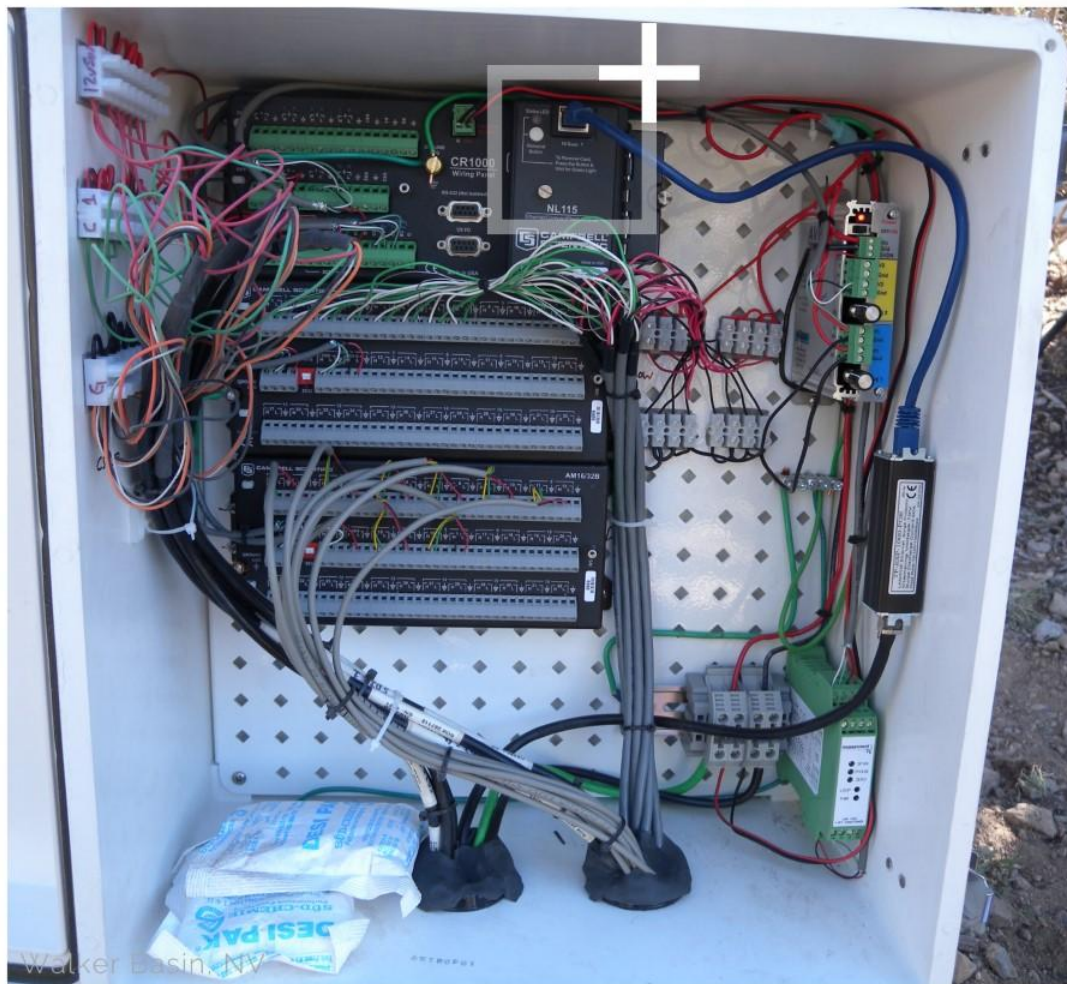
Chairs: Renée Brown, Scotty Strachan



- Open group of scientists
- Best Practices community
- How to move science forward
- Tool (field & software) development
- Collaborate & share
- Meets monthly, 1<sup>st</sup> Tuesday
- Students welcome!







## CLUSTER HIGHLIGHTS 2019-20

- Guest presenters / internal projects
- Sensor data QA/QC tools
- ESIP Lab w/Martha Apple MT Tech
- Agency engage (EPA, USGS, NOAA)
- Joseph Bell USGS, Winter session
- Rep'd at National Research Platform
- Sounding board for projects/tool development (LoRa, Dendra)
- ***Open-source? LoRa? Agency collab?***
- ***Real-time viz & QC? Edge computing?***
- ***Come talk in our Summer session!***

# Components of NGWOS: Delaware River Basin Pilot



Identify water monitoring gaps and data needs related to integrated water modeling and stakeholder decision-making.



Establish integrated set of fixed and mobile monitoring assets in the water, ground, and air.



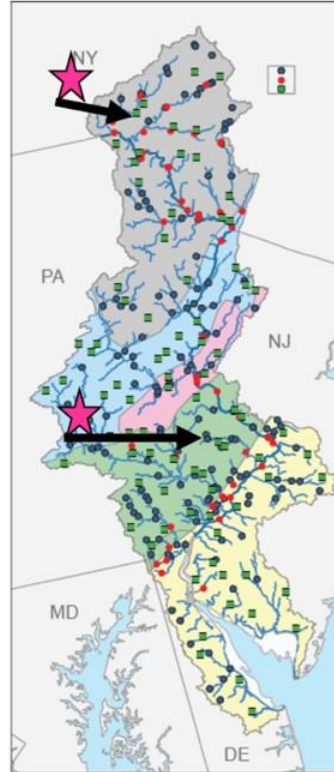
Integrate delivery of water quantity, quality, and use data.



Work with partners and stakeholders to inform modern water prediction and decision-support systems.

## Contact info:

- Program Coordinator:  
Chad Wagner [cwagner@usgs.gov](mailto:cwagner@usgs.gov)
- Deputy Program Coordinator:  
Mike Woodside [mdwoodsi@usgs.gov](mailto:mdwoodsi@usgs.gov)

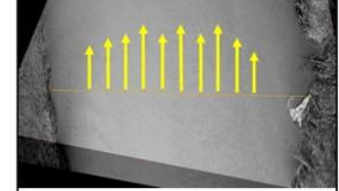


## Non-contact surface velocity

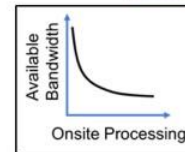
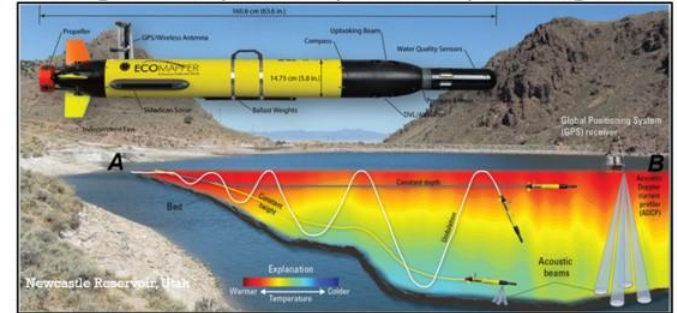
### RADAR



### Image velocimetry



## Profiling: Salinity & Temperature profiling in DRB



Topology







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# Questions?

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**Contact Us:**  
staff@esipfed.org

**Keep up on all things ESIP:**  
[bit.ly/ESIPmondayupdate](https://bit.ly/ESIPmondayupdate)



**ESIP Meetings**  
[ESIPFED.ORG/MEETINGS](https://esipfed.org/meetings)



**ESIP Collaboration Areas**  
[ESIPFED.ORG/COLLABORATE](https://esipfed.org/collaborate)



**ESIP Lab**  
[ESIPFED.ORG/LAB](https://esipfed.org/lab)

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